CROWN LAND EXPERIMENTAL IMPROVEMENTS, AND CORK AND KERRY NEW ROADS.

COPIES OF FURTHER PAPERS relating to Experimental IMPROVEMENTS on the Crown Lands at *King William's Town*, in the Barony of *Duhallow* in the County of *Cork*; and to the NEW LINES of PUBLIC ROAD in course of construction through the district in which the said Lands are situated, in the Counties of *Cork* and *Kerry*; for the purpose of encouraging the EMPLOYMENT of the LABOURING POOR in similar IMPROVEMENTS on other Estates in *Ireland*.

IN submitting a further Report from Mr. Griffith on the subject of the Experimental Improvements on the Crown Lands of King William's Town, in the county of Cork, the Commissioners of His Majesty's Woods, &c., are anxious to recal to the recollection of Parliament, the circumstances under which the reclamation of this property was in the year 1831 first undertaken.

It having been thought desirable to try some experiments in Ireland in reclaiming waste land, a mountainous estate belonging to the Crown was selected, in a situation almost at that time inaccessible, and where no species of Improvement had ever been attempted. Under the authority of Parliament, the Commissioners of His Majesty's Woods commenced a Road from Roskeen-bridge, between Kanturk and Mallow, in the county of Cork, to Castle Island, in the county of Kerry, passing through the centre of the Crown property; and at the same time commenced a village and other improvements, the extent of which has been submitted to Parliament in former Reports.

The Commissioners have the satisfaction of finding that the improvements that have taken place, have thus far exceeded the utmost expectations which were entertained on the subject, and that a wild sterile bog and moor is becoming every day more fertile and valuable; and it is hoped the example thus set will be extensively followed by those who have property of a similar description.

The Commissioners cannot conclude these observations without expressing how much they are indebted to Mr. Griffith, the Civil Engineer, under whom the works have been carried on, for his constant and unwearied attention in enabling them to give a fair trial to these Experimental Improvements.

DUNCANNON.
B. C. STEPHENSON.
A. MILNE.
} Commissioners of His Majesty's Woods, Forests, Land Revenues, Works and Buildings.

Office of Woods, &c., June 8th 1836.

Mr. *Griffith's* FURTHER REPORT of the progress made on the New *Cork* and *Kerry* Roads, and of the Improvements on the Crown Estate of *King William's Town*, County Cork.

My Lord and Gentlemen, Irish Office, London, 3 June 1836.

IN the month of January 1834, I had the honour to communicate to your Board a statement of the progress that had been made on the New Cork and Kerry Roads, towards the formation of which Parliament had granted the sum of 17,000 *l*, and presentments were made respectively by the grand juries of the counties of Cork and Kerry, to the amount of 7,937 *l*., making a total of 24,937 *l*.

Upwards of two years having elapsed since the date of my former Report, I have now to Report that one of the roads, namely, that from Killarney to Mallow, which commenced at Sharmogh Cross on the road from Killarney to Cork, and terminated at Roskeen Bridge, over the river Blackwater, six miles west of Mallow, has been completed and transferred during the last year to the care of the Commissioners of Public Works; and that the other, which extends from Castle Island in the county of Kerry towards the city of Cork, has been completed between Clonbanin, where it joins the new road from Killarney to Mallow, and the summit of Knocknaboul, two miles to the west of King William's Town; and the remainder between that point and Castle Island, a distance of about eight miles, is in such a state of forwardness that I expect to be able also to finish and transfer it to the Board of Public Works before the termination of the present year.

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The entire length of the new roads completed, and which are now open to the public, amounts to 34 miles; and I have the pleasure to state that the whole continued sound during the last wet winter, and the surface of the metalling is now becoming firm and smooth. In part of the road, particularly towards the eastern extremity, the traffic is very considerable, and it is increasing daily throughout the line. At present the intercourse from Castle Island by King William's Town to Cork is not considerable, but I have no doubt that the new inn, as well as the shops at King William's Town, will have abundance of business as soon as the whole line shall have been completed.

As above-mentioned, the entire sum granted for the service of the roads, including the presentments, amounts to - - - - - - - - -		24,937
And in respect to the expenditure; I have to state that the sum paid for work done up to the 31st March 1836, amounted to - - - -	20,081	
And, after a careful examination of the portion of the road which is still unfinished, I am of opinion that it will be completed for the sum of -	3,256	
Making together the Sum of - - £.		23,337

So that there will be a residue of about 1,600*l.*, after the main lines of the Cork and Kerry roads have been completed, which sum may be most usefully expended on road improvements, formerly contemplated; the most important of which will be the opening a new branch road from King William's Town to Mount Infant, mentioned in my former report, and originally recommended by Mr. Weale, in his first valuable communication suggesting the roads and other improvements at Pobble O'Keeffe. The completion of this road would tend much to the advantage of the Crown estate, not only by opening a direct communication with Mill-street, and the country to the south, but also by diminishing the distance by the road from the Carrigdulkeen limestone quarries, in the county of Kerry, both to the tenantry resident on the southern portion of the estate, and also to King William's Town; and thereby enable the crown tenants to draw two loads of limestone each day instead of one, which is the most that can at present be effected. In addition to which I expect I shall be enabled to complete the several other short but useful farm-roads through the estate, without exceeding the limits of the original grant.

As it is desirable that the Mount Infant road should be commenced as soon as possible, I have to suggest that I may be authorised to apply to the grand jury of the county of Cork for a presentment, at a nominal price, say 1*s.* a perch, to enable me to open the road for a short distance near its termination at Mount Infant, where it will pass through the estate of Mr. Cronin. I do not anticipate any objection on the part of that gentleman, as his tenants are anxious for the road, and I have no doubt the grand jury of the county of Cork will feel pleasure in giving its authority for the completion of so useful a work. On a former application from me the Cork grand jury granted a presentment for a new road (altogether at the cost of the county), which passes through the crown lands, and connects King William's Town with the town of Newmarket, and the southern part of the county of Limerick; and the Mount Infant road will, in fact, be a southern continuation of the Newmarket road, which is now nearly completed.

Of the Improvements on the Crown Lands.

In my last Report I also described the situation and character of the soil and climate of the Crown estate of Pobble O'Keeffe, on which estate some interesting agricultural experiments are now being carried on under my direction.

These experiments, as you are aware, were commenced by the inclosing, draining and cultivating four English statute acres of an unusually wet and spongy bog, the aspect of which was so unpromising that, had not circumstances required it, I should not have thought it advisable to attempt so hopeless an undertaking; but I am happy to say the result has much exceeded my expectations, and that although the outlay has been considerable, still the returns are sufficient to warrant the expectation that the whole expenditure will be more than repaid at the end of a few years.

I shall here beg to insert a statement of the system of reclamation adopted by me as suited to different varieties of bog, and also of the expense and probable return. This statement was prepared by me last summer, at the request of the Irish Public Works Committee of the House of Commons, and is included in the Appendix to their Report, page 329.

The bog and moor-lands of this district may be divided into three classes; viz.

1st. Flow-moss or bog, varying from five to 20 feet in depth; the surface is composed of bog-moss (sphagnum) in vegetation, and a few tufts of heath; the subsoil is gravelly clay.

2d. Close-grained mountain-bog, surface covered with coarse grass and some moss (sphagnum), in vegetation; the depth of bog varies from two to ten feet.

3d. Shallow mountain bog or moss; depth of bog from six inches to three feet, subsoil clay or clayey gravel; the surface frequently uneven and tufty; the vegetation consists of coarse grass, heath and rushes. The system followed in reclaiming these several varieties of bog will differ in the detail according to circumstances; but the following may be taken as the average process:

1. Flow-moss: this is by much the most expensive; and, in proportion to the outlay, the least remunerative subject for reclamation; and in mountain districts, where the second and third classes are most abundant, its reclamation should not be attempted, unless under very peculiar circumstances; but its surface may be drained, with a view to the improvement of the

quality

quality of the turf or peat for fuel; and if young cattle are allowed to run on it in summer, the surface will soon be found to yield a crop of coarse grass, mixed with heath.

For the reasons stated in my Report on the Crown Land Improvements of Pobble O'Keeffe, and printed by order of the House of Commons, the 26th March 1834, the reclamation of about 20 acres, English statute measure, of the worst variety of flow-bog, varying from six to 14 feet in depth, has been attempted; and in proportion to the progress made, the success has been fully as great as could have been anticipated.

The bog was, in the first instance, surrounded by a drain to cut off the water from the adjoining hills, and also from that part which it was not intended to reclaim; drains were then cut through the bog, both lengthways and across, so as to divide it into squares, each containing four statute acres. Owing to the extreme wetness and pulpiness of the bog, these drains could not be opened at once, but required considerable caution and attention in the progress; an opening, four feet wide and three feet deep, would nearly close up in 24 hours; consequently the commencement was made by a narrow and shallow drain, which was gradually widened and deepened, and upwards of a year had elapsed before the principal drains in a considerable portion of the bog were in a sufficiently forward state to admit of the commencement of the small drains intended to dry the surface.

The large drains, when completed, were six feet broad at top, two feet at bottom, and four feet deep.

The second class, or surface-drains, were next cut parallel to each other, at the distance of eight yards. The upper part of each of these drains consisted of an excavation, two feet broad and two feet deep; in taking out the stuff care being taken to cut the sods with a broad spade or draining-tool, so as not to break them: the sods were laid on the surface of the bog, to consolidate. Subsequently, when the sides of the drain became more compact by exposure to the air, a second drain, four inches broad and twelve inches deep, was cut in the centre of the bottom of the two-foot drain; thus leaving a shoulder on either side, ten inches in breadth: afterwards, where the sides of the lower drains had consolidated, and exhibited no tendency to collapse, the surface-sods, cut in the first instance, were placed with their upper surface downwards on top of the four-inch drains, and were supported in that position by the trenches or shoulders on either side; the remainder of the bog-soil excavated from the drain was then thrown on top of the sods, till the excavation was filled up; and thus a covered drain or sewer was formed, at the depth of three feet below the surface of the bog.

To facilitate the discharge of the water from the under-drains, one open drain was cut through the centre of each of the four-acre fields, to receive the water and discharge it into the principal or surrounding drains.

Six months after the completion of the drains, the surface of the bog was dug up and left in a rough state, exposed to the air during the winter, and in the following spring it was chopped or cut by the spade into small pieces, so as to render it as fine as possible; the surface was then covered with clay to the depth of nearly four inches. The clay was drawn for a distance of about 600 yards by means of a moveable wrought-iron railroad[*], and afterwards the surface was covered with lime, in the proportion of 37 barrels, each containing 42 gallons, to an acre.

On the surface thus prepared, potatoes were planted, and a moderately good crop produced.

Following the cropping of one portion of the bog, the tillable surface of which, owing to building and plantations, from four acres has been reduced to 2 A. 3 R. 13 P. The second year a portion, containing 2 A. 0 R. 34 P., was again planted with potatoes, and the remainder, containing 2 R. 19 P., with turnips; the potato land being manured with 20 barrels of lime to the acre, in compost mixed with clay; and the turnip land, partly with lime, partly with peat ashes, and partly with stable dung. Owing to the unusual coldness and wetness of the season, the potato crop was inferior to what was anticipated; but the turnips were excellent. At present the potato land has been laid down, and sown with oats, York meadow-grass and white clover; and at this moment, in the beginning of July, the appearance of the crop is very favourable, and it is probable will be as productive as can be expected from reclaimed bog, which usually yields abundance of straw, but a small weight of corn, as compared with sound

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[*] The moveable railroad is formed of wrought-iron bars, usually about twelve feet long, two inches broad, and half an inch thick. These bars are supported on planks made from young Scotch fir, or larch-trees. They are prepared by sawing off the outside slabs, on two opposite sides, and then running a cut through the centre. The planks thus formed are four inches broad at top, six inches at bottom, and three inches thick, the length being usually 12 feet.

On each of these planks an iron bar is fixed on edge, by means of two cast-iron chairs, or stands, spiked to its upper side, at the distance of one foot six inches from either extremity; one end of the bar being fixed in one chair, and the other, passing through the second chair, projects three feet beyond it, when a second plank and rail is placed in continuation of the length beyond the first; the projecting end of the first bar is fixed into the first chair of the second plank, and by this means the joining of the rail is always placed one foot six inches beyond the termination of the planks, and thus a firm joint is obtained.

In laying down this moveable railroad, two parrallel lines of planks, with rails attached, are laid on the bog, and the proper distance between each is preserved by the insertion of an half-inch square wrought-iron bar, crooked or bent at both extremities, into staples attached by spikes to the under surface of each plank.

For the farther strength and security of the joining of the planks, thimbles, made of sheet-iron, of a triangular form, are attached to one end of each plank, and the end of the next having been cut into the same shape, is inserted into the sheet-iron thimble. The cost of a moveable railroad, of the above description, is 3 *s.* 3 *d.* per yard, including both sides, and when laid level a man can with ease push on a waggon containing 18 cwt.

sound upland. A crop of mangel-wurzel has been sown on the turnip land of last year; it also looks well; but this portion of the bog, together with other reclaimed fields now under crops of potatoes and turnips, has been dunged from the cowhouse and stable; in the former four cows were stall-fed, during the last winter, on the turnips and a portion of the very small potatoes.

In calculating the amount of the expenditure in all departments of reclamation and cultivation, from the commencement to the present time, the outlay and return per acre is as follows:

Flow-Bog, No. 1.

	£.	s.	d.
Reclamation:			
Fencing, with double ditches, per acre	–	12	–
Draining*	1	17	–
Digging up and chopping the surface, &c.	1	10	–
Covering with clay, by means of a moveable railroad, to the depth of nearly four inches	5	10	10
Total Cost of Reclamation	9	9	10
Manure:			
Lime, 37 barrels, each 42 gallons, at 1 *s.* 6 *d*, per barrel	2	15	6
Cultivation:			
First year: cost of seed potatoes, planting and digging, per acre	4	12	4
Second year: ditto - - - - - ditto	4	2	4
Additional lime, 20 barrels	1	10	–
Third year: seed oats, tilling, sowing, reaping and threshing	1	18	6
Hay-seed and clover	–	16	–
Fourth year: mow and sow hay	–	8	–
£.	25	12	6

PRODUCE OR RETURN.

				£.	s.	d.
First year: value of potato crop 816 stone, at 2½ *d.* per stone				8	9	2
Second year†				8	5	6
Third year: expected produce of oat crop 105‡ stone, at 9 *d.* per stone	3	8	9			
Value of straw	1	–	–			
				4	8	9
Fourth year: expected value of hay crop, two tons York meadow-grass and clover hay, each 1 *l.* 10 *s.* per ton				3	–	–
Total produce of one acre, for four years				24	3	5
Total expenditure				25	12	6
Portion of Outlay not returned at the end of Four Years, at which time the reclaimed Bog laid down in Pasture would be worth about 10 *s.* per acre				1	9	1

Of the Second Class of Bog.

THIS variety is naturally very superior to the first, its texture is close and compact, and when burnt it yields a considerable portion of red or yellowish red ashes, while the residuum from burnt flow-bog consists of a very small quantity of white ashes, of no agricultural value. In reclaiming compact bog, a coat of two inches and a half of clay will be sufficient, while flow-bog requires at least a depth of four inches.

The general system pursued in reclaiming compact bog is similar to that adopted for flow-bog, but the draining is not so expensive, and the digging and chopping the surface is more easily effected.

EXPENSE OF RECLAIMING AN AVERAGE STATUTE-ACRE OF COMPACT BOG.

	£.	s.	d.
Fencing-in six-acre fields, with double ditches, top sown with furze seed	–	12	–
Draining	1	2	–
Levelling and digging surface	1	8	–
Covering surface with clayey gravel, two inches in depth, the clay being raised from the surrounding fences, and from the bottom of the drains	2	9	–
Making compact heaps with alternate layers of surface sods and lime, including turning and spreading	–	12	–
Total Cost of Reclaiming and Fencing per Acre	6	3	–

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* The usual cost of draining is about 1 *l.* 4 *s.* per acre, but in very wet spongy bogs the extra labour of opening the drains adds considerably to the cost

† The second crop of potatoes is usually much better than the first, but, owing to the wetness of the season of the year 1834, in the West of Ireland, the produce of potatoes in the mountains was much below an average crop.

‡ The actual produce has been 135 stone, of 14 lbs. to the acre.

Manure :			
37 barrels of lime at 1 *s.* 6 *d.* per barrel - - - - - - - -	2	15	6
Amount of expenditure for four years, cultivation same as flow-bog, or class No. 1. - - - - - - - - - - - -	13	7	2
Total Expenditure on Reclamation and Four Years' Cultivation - -	22	5	8
The produce of each crop raised on reclaimed compact bog will be superior, both in quantity and quality, to that raised from flow-bog ; but supposing the return to be the same as that from flow-bog, as given above, the amount of the Return on four years' crops, two of potatoes, one of oats, and one of hay, will be - - - - - - - - - -	24	3	5
There will therefore be a Profit of - - £.	1	17	9

per acre in four years' cultivation ; at which time the land laid down in grass will be worth about 12 *s.* 6 *d.* per acre.

Of the Third Class of Bog.

This class is described as compact bog, of variable depth, and which, in its natural state, yields coarse mountain pasture for cattle during the summer months ; the least expensive and most profitable mode of treating this variety of bog will be to improve the quality of the herbage, and render it capable of producing good meadow and pasture.

This can be effected by fencing, draining and liming the surface, at the following rate per statute acre :

	£.	*s.*	*d.*
Cost of fencing-in six-acre fields - - - - - - - - -	–	12	–
Draining, as in the flow-bog, but with less, owing to the solidity of the bog -	1	4	–
Covering the surface with lime, 37 barrels to the acre, at the rate of 1 *s.* 6 *d.* per barrel - - - - - - - - - - - -	2	15	6
Total Cost of Reclaiming an Acre of coarse Mountain Pasture, so as to render it worth 10 *s.* per acre for Meadow and Pasture - - £.	4	11	6

The foregoing details have been extracted from the accounts of the actual expenditure on the different departments of reclamation and cultivation, at the Crown-farm of Pobble O'Keeffe ; but it is to be observed, that the works are conducted with great system and regularity, and with strict attention to economy ; and unless similar methods be taken in other places, the same results will not be obtained : but it is likewise to be observed that the cost of lime at the Crown-lands is considerable, and it is only in the summer months it can be obtained at so cheap a rate as 1 *s.* 6 *d.* per barrel ; in favourable situations it may be obtained at 1 *s.* per barrel, and even less. Were this the case, the third class of bog could be fenced, drained and manured, at the rate of 3 *l.* 13 *s.* instead of 4 *l.* 11 *s.* 6 *d.* per statute acre.

Encouraged by the success of the first experiments, improvements were commenced on a large scale, not only on the remainder of the bog adjoining the four-acre farm already alluded to, but on different qualities of moory and mountain land ; which latter, as has been shown, can be reclaimed at a less expense, and in the end will be more valuable than the flow or spongy bog.

The extent of bog or boggy mountain land, at present under tillage or in progress of improvement, amounts to 154 acres, of which 95 acres are under tillage, and the remainder consists of mountain meadow and pasture land, which has been drained, and in part covered with lime on the surface.

It is to be observed that, previously to the commencement of the improvements, nearly the whole of this land was in an unprofitable state, having been valued by Mr. Brassington the Crown Surveyor, at an average rate of 4½ *d.* per acre per annum ; but the greater part of which is now capable or producing fair crops of turnips, oats, potatoes and meadow. In addition to which, I have to state that 50 acres of the mountain land have been drained, fenced and planted, with a view to shelter the improvements from the west and south-west winds ; and 1815 perches of large rampart fences, consisting of a high bank or dike in the centre and a grip or trench on either side, have been made for the purpose of dividing new farms in the northern portion of the estate.

The detail of the expenditure, arranged under different beads, will be found in the Appendix; but I shall here state a few of the most important items :

	£.	*s.*	*d.*	£.	*s.*	*d.*
Cost of draining, claying, liming, cultivating and improving bog-land at King William's Town, including dung, seed, and the saving of the crops - - - - - -	1,155	14	4½			
Fencing and improving kitchen-garden and nursery, including planting in the nursery - - - - -	129	1	10½			
Expenses of draining, fencing and planting 50 acres of screen plantation - - - - - - -	498	8	6			

(*continued*)

	£.	s.	d.	£.	s.	d.
Expense of erecting a large lime-kiln, and making a road thereto - - - - - - - - -	61	1	1			
Cost of opening Culm Colliery, discovered in 1835 - -	30	15	9 ½			
Cost of five draught-horses - - - - - - -	80	5	–			
Forage of farm-horses for three years, farming implements and forge implements - - - - - - - -	231	16	10			
Cost of railroad, including timber, waggons, &c. - -	132	12	7 ½			
Fencing, and embanking the New-river course at King William's Town, so as to prevent inundations from the river Blackwater - - - - - - - -	132	5	4 ½			
Inclosing and fencing new farms in Lower Carrigans, together with sundry other improvements not connected with King William's Town farm - - - - - -	184	1	7			
Expenditure for sundry purposes; for detail of which see Appendix - - - - - - - - - -	499	7	3 ½			
Total Expended on Improvements to 31st March 1836 - - £.				3,135	10	4
Amount of buildings in King William's Town, together with the erection of three slated farm-houses, each two stories in height; for details see Appendix - - - - - - - - - - - - -				2,120	13	4 ½
Total Expenditure on Pobble O'Keefe, up to 31st March 1836 - £.				5,256	3	8½

From the foregoing statement it appears that a large sum of money has been expended, and that as yet a comparatively small return has been made; but it must be recollected that, in effecting improvements in a country which, in the commencement, was nearly as inaccessible as the wilds of America, considerable expenditure must be incurred in the erection of buildings and forming of establishments, which would not be required in other places; but now that all these preliminaries have been completed, the effect will be much more striking and productive when compared with the sum expended.

During the present year, the produce of the crops will be considerable, the extent under cultivation being altogether, as already stated, 154 acres, the detail of which is as follows:—

	A.	R.	P.	A.	R.	P.
Extent of bog-land at present sown with Oats - - -	33	1	26			
— Turnips - -	20	1	7			
— Mangel-wurzel -	–	3	–			
— Potatoes - -	17	3	24			
— Rye - - -	3	1	33			
— Rape - - -	16	–	11			
— Spring vetches -	2	–	–			
— Clover and grass seeds - -	1	2	32			
Total Arable - - -				95	2	13
Meadow, which has been drained and partly limed - - -				58	2	8 ½
Total Acres - - -				154	0	21 ½

This statement shows that much has been effected during the last year; and if no more were attempted, sufficient has been accomplished to prove that mountain land may be improved with success; but as, in fact, the experiments are only in their infancy, it is very desirable that they should be continued until it has been ascertained what system of cultivation is best suited to the improvement of a mountain district, situated near to the south-west coast of Ireland, in an elevated position, exposed to cold and wind, and having naturally a poor soil, consisting of a surface of boggy turf, with a subsoil of clay or clayey gravel.

From what has already been effected, I am of opinion that the cultivation of turnips and other green crops should be preferred to oats and potatoes, excepting as far as straw may be required for manure, and potatoes for the use of the inhabitants.

During the last year there were four acres two roods British statute measure of bog land under turnip crop, which produced altogether 86 tons 17 cwt. of turnips of various kinds, namely, Swedes, globe, greentop, white and red Norfolk, &c.; the average produce being nearly equal to 20 tons per acre.

	£.	s.	d.	£.	s.	d.
During the last winter 14 cows were fed on these turnips, which, when put into the stalls, had cost - - - - - -	53	5	3			
To this sum must be added the cost of raising the turnips, including all expenses - - - - - - -	42	8	4			
Also the cost of hay, and other fodder, provided for the cattle, together with straw for litter - - - - - -	11	7	3			
Also payments made to attendants - - - - -	5	15	–			
Total Outlay -				112	15	10

	£.	s.	d.	£.	s.	d.
Amount received on sale of 14 fat cows	121	12	7			
To which must be added the value of 360 cubic yards of cow-house manure, at 1 *s.* 4 *d.* per cubic yard	29	–	–			
Total Value				150	12	7
Leaving an actual Profit, on Feeding 14 Cows, from the produce of Four Acres and a Half of Turnips grown on an improved Bog, of rather more than 8 *l.* per Acre £.				37	16	9

The foregoing result proves the great advantage to be derived from the cultivation of turnips on mountain land for the purpose of feeding cattle, not only from the immediate profit to be derived, but from the produce of vast heaps of manure, which could not be obtained through any other means. It will be observed that this year there will be upwards of 20 acres of turnips, which will enable us to feed about 50 head of cattle during the next winter, and perhaps more, should the season prove favourable.

During the last year great pains were taken to ascertain the exact produce per English statute acre of the different crops raised from the bog-field, and the result has been as follows:

	Tons.	Cwts.	Stones, of 14 lbs.
Oats, per statute acre	0	16	17
Straw	1	5	4
Swedish turnips, manured with lime, clay, and a little dung	17	17	6
Globe turnips, manured with lime, clay, and some ashes	18	14	–
Globe and white and red Norfolk turnips, manured with lime, clay, and some bone-dust	20	6	–
Mangel-worzel, manured with lime, clay, and some dung	11	–	–
Potatoes, manured with lime, clay, and some dung, raised from bog, which had been in cultivation for three years	5	7	–
Ditto, raised from bog, manured in a similar manner, and raised from a very wet, spongy variety of bog, being the second crop	2	14	–

On comparing the productiveness of the different crops raised from the bog, under similar treatment and general circumstances, I have found from the foregoing, as well as from other facts of the same kind, that the value of the turnip crop per acre is more than double that of any other; and the relative difference becomes more apparent when the bog-land on which the crops are raised has not been perfectly reclaimed:

In one part of the improved bog, situated immediately to the south of the new village called King William's Town, crops of turnips and potatoes were raised last year, each crop having been cultivated and manured in exactly a similar manner.

	£.	s.	d.	£.	s.	d.
The produce of the turnips (red Norfolk) was 17 tons 10 cwt. per statute acre, which, at 15 *s.* 6 *d.* per ton, the ascertained value of white turnips raised at King William's Town during the last year, amounts to	13	11	3			
Deduct cost of tillage, &c.	5	18	–			
Profit per Acre - £.				7	13	3
The produce of potatoes raised on a similar bog, adjoining the turnips, was two tons 14 cwt. per acre, the quality inferior, and not worth more than 20 *s.* per ton, value of crop, per acre	2	14	–			
Cost of tillage, including manure	5	12	4			
Loss per Acre - £.				2	14	8

This is a very striking difference; and it induces an opinion that on light spongy bog, similar to that at King William's Town, turnips are much to be preferred to potatoes as an initiatory crop.

It may be alleged with truth, that turnips grown on newly reclaimed spongy bog would be inferior in point of quality to turnips grown on sound upland. I have not yet had an opportunity of ascertaining the proportion, but I should think that one ton of upland turnips, say of globe or Norfolk, will be equal to one ton and a half of similar kinds of turnip grown on bog. I have ascertained that a single cow can consume one and a half cwt. of 112 lbs. in one day, of globe or Norfolk turnips grown on bog, and not more than half that quantity of Swedish turnips; but it is to be observed that the latter were raised from bog in a more perfectly reclaimed state than that which produced the Norfolk turnips.

In respect to the preparations made for additional plantations, I have to state that the nursery contains 29,667 of three years old trees, consisting of sycamore, alder, spruce, larch, and Scotch fir; also 200,000 of seedling oaks, and 51,000 of seedling Scotch fir. The oaks were produced from acorns sent from the Royal Forests in England, by order of the Board; and the Scotch fir (pinus sylvestris), were produced from a bag of Norway fir cones, presented to me by Mr. John Musgrave of Tuorn, county of Waterford, for the benefit of the Crown estate.

estate[*]. I am happy to say that the seedling firs which have been transplanted are doing extremely well, as are also the oak seedlings.

Among the new features which distinguish the progress of the improvements for the present year, may be mentioned the erection of a large lime-kiln for burning lime for agricultural purposes, and the discovery and opening of a culm colliery; the first was rendered necessary in order to derive full advantage from the acquisition of the two limestone quarries, mentioned in my former Report, and which have been occupied and worked during the last six months, and from one of which, Carrigdulkeen quarry, in the county of Kerry, sufficient limestone has already been drawn to produce upwards of 3,000 barrels of lime, of 42 gallons each, a quantity sufficient to manure about 75 acres of land; but in effecting this object the whole of the turf prepared for lime-burning was exhausted; and had it not been for the fortunate discovery which I made of a thin bed of anthracite or culm on the Crown estate, within a mile of King William's Town, we should have been obliged to discontinue lime-burning till the month of August next, as the new turf could not have been dry and ready before that time.

In my former Report (page 43), I mentioned that "the strata of the country in which the Crown-lands are situated, consist of alternations of hard quartzy sandstone, hard sandstone-slate, graduating into sandstone-flag, and gray and black shale, the whole forming a portion of the great southern coal-district of Ireland, many parts of which contain thick and valuable beds of non-flaming coal or mineral charcoal, similar to that of Kilkenny, and of anthracite or culm, which latter is much used in the country for burning lime for agricultural purposes; but that hitherto no traces of coal or culm had been discovered within the boundaries of the Crown-lands;" but, fortunately, this is no longer the case, as I have already discovered two beds of culm on the lands of Glencollins, and I think it probable that others may occur which have hitherto escaped my observation. The culm-bed, on which workings have been commenced, is favourably circumstanced for being unwatered, by means of an adit or subterranean gallery, which has been already conducted by excavation from the level of a neighbouring stream through the strata of the hill till it struck the bed of culm, which, being thus freed from water, can be worked with facility and economy. The direction or strike of the culm-bed is nearly east and west, and the dip or inclination is to the north, at an angle of about 70 degrees from the horizon. The culm-bed rarely exceeds 16 inches in thickness; this is unfavourable; but, owing to its nearly upright position, it can be wrought, without difficulty, on the same principle as a metalic vein; and the culm can be raised, at the cost of about 4*s.* per ton. By means of the culm we shall be enabled to burn lime at the rate of from 10*d.* to 1*s.* per barrel; while, formerly, the lime purchased cost from 1*s.* 6*d.* to 1*s.* 7*d.* per barrel; and, on the whole, I have no doubt there will be a saving of 6*d.* on each barrel of lime, which will make a reduction of 1*l* per acre on the manuring of the land, in addition to which we shall not be restricted in quantity. There will be no difficulty in raising any quantity of culm required; but it would have been nearly impossible, from a want of a sufficient number of labourers, to prepare a supply of turf, or to have kept the limekiln constantly at work.

Having thus provided the means of supplying abundance of lime, which must be considered to be the foundation of improvement, I would, in conclusion, suggest the propriety of exertions being made to induce the tenantry to cultivate turnips and other green crops on their separate farms: if they once began, they would immediately see the advantage to be derived from it. The cultivation of turnips and green-crop husbandry have been introduced with success on the estate of the Earl of Gosford, and in the neighbouring district of the counties of Armagh and Tyrone, through the exertions of Mr. Blacker; in the county of Meath, by the Marquess of Westmeath, and Mr Charles Hamilton, of Hamwood; and likewise, in the county of Roscommon, by the Marquess of Westmeath, and by other persons: but these valuable improvements have been hitherto confined to lowland and comparatively fertile districts. It remained for us to introduce green-crop husbandry into the boggy and hitherto unfruitful mountains of Cork and Kerry; and, from the success of the experiments that have been made, no doubt can be entertained as to the successful result. Already have the landed proprietors of the rich lowland country been surprised at the invasion of fat cattle from the mountains, competing, at the Easter markets, with the stall-fed cattle from their demesnes, where alone turnips have hitherto been grown; but I trust the day is not far distant when not only the lowland but the mountain farmers will be enabled, by means of green crops, to feed cattle during the winter; and though they may not fatten many beasts, still they will double or quadruple the quantity of milk now produced during the winter months by their wretched half-starved cows: they will likewise produce four times the quantity of manure, and thereby be enabled to derive from the cultivated land a proportional return of corn, not only in point of quantity, but vastly superior in quality to the dwindled grain now produced from their worn-out lands.

I have the honour to be,
My Lord and Gentlemen,
Your most obedient Servant,
(signed) *Richard Griffith.*

The Commissioners of
His Majesty's Woods, &c.
Whitehall-place, London

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[*] Mr. Musgrave made a considerable importation of fir cones from Norway, which he distributed gratuitously among the landed proprietors of Ireland, with a view to the improvement of the quality of the fir timber grown in Ireland, it having been fully ascertained that the timber produced from the American seed is very inferior to that produced from the Norway seed and unfortunately, American seed is at present almost exclusively used throughout Great Britain and Ireland

APPENDIX.

EXPENSE incurred in Farming Improvements at *Pobble O'Keefe*, from the commencement up to the 31st March 1836.

EXPENDITURE CONNECTED WITH THE LAND IMPROVEMENTS.	£.	s.	d.	£.	s.	d.
Cost of draining, fencing and improving Four-acre Farm	119	1	6½			
Draining, fencing, manuring and cultivating bog-fields, north-east of King William's Town	221	10	1½			
Draining, &c. nine new fields, each containing three acres, situated to the east of the above	225	16	3			
Levelling, draining and improving fields between the village and the river	83	8	9½			
Improving middle division of Model-farm, including draining, fencing, &c.	127	2	5			
Improving north division of ditto	16	13	6½			
Improving south division of ditto	168	6	4½			
Quarrying and draining limestone, and burning lime	193	15	4			
				11,55	14	4½
Nursery at King William's Town, including draining, reclamation, trees, planting, &c.	90	6	10½			
Kitchen garden, fence-walls, draining, levelling, manuring and cultivating	38	15	–			
				129	1	10½
Expenses on draining, fencing and planting 50 acres of screen-plantation				498	8	6
Expense of erecting limekiln, and forming road thereto				61	1	1
Cost of opening Culm Colliery, discovered 1835				30	15	9½
Cost of five draught-horses				80	5	–
Forage of farm-horses for three years	174	3	10½			
Farming implements and horse-tackling	48	14	4½			
Forge implements	8	18	7			
				231	16	10
Cost of railroad, including timber, waggons, &c.				132	12	7½
Fencing and embanking the new-river course at King William's Town, so as to prevent inundations from the river Blackwater				132	5	4½
Inclosing and fencing new farms in Lower Carrigans	123	14	4			
Fencing, improving and liming new fields north of River Plantation	18	19	6			
Making lime and clay composts for manure	22	7	1½			
Fences, north of east and west plantations	2	2	–			
Improvements at New Farm-house, No. 1.	2	8	6			
Ditto - - - - ditto - No 2.	10	13	1½			
Ditto - - - - ditto - No. 3.	3	17	–			
				184	1	7
Building sundry fence-walls, including materials at New Village and School-house Garden	20	11	6			
Forming and metalling farm-roads	13	5	10			
Collecting stones for Mount-infant road	5	7	11			
Smith-work and iron for improvements	85	17	1½			
Carpentry for ditto	17	5	2			
Lead for ditto	3	4	9			
Timber and carriage for ditto	47	18	9½			
Herding and attending cattle, &c.	36	1	1½			
Watchmens' wages	38	15	5½			
Messengers, on various occasions, from commencement	14	2	7			
Salaries and travelling expenses, from commencement	83	4	11			
Fuel for office, &c.	34	13	4			
Furniture for new inn, shop, &c.	86	5	8½			
Stationery and postage	12	13	1			
				499	7	3½
TOTAL Expenditure connected with the Land Improvements - - £.				3,135	10	4

(continued)

	£.	s.	d.	£.	s.	d.	£.	s.	d.
Brought forward - - - - - -							3,135	10	4
Expense of New Buildings, up to 31 March 1836.									
Farm-yard, cow-stable and piggery - - -	86	19	11						
Storekeeper's house and lenny - - - -	45	17	4½						
New inn, stables, and yard walls - - - -	487	1	7½						
				619	18	11			
Tailors and shoemakers' houses - - - -	205	19	1½						
Stables to ditto - - - - - -	34	7	6						
				240	6	7½			
Tradesmens' cottages - - - - - -	162	11	4						
Stables to ditto - - - - - - -	34	3	–						
				196	14	4			
Shops - - - - - - - -	308	14	5½						
Stables to ditto - - - - - - -	37	2	9½						
				345	17	3			
School-house - - - - - - -	355	–	9						
Offices and yard-walls to ditto - - - -	52	19	3½						
				408	–	–½			
Model Farm-house, quarrying stones, and price of timber, &c. -				54	4	–			
No. 1. farm-house in Tooreenkeagh - - - - - -				90	18	2			
No. 2, farm-house in Carrigauna - - - - - -				88	12	7			
No. 3. farm-house in ditto - - - - - - -				76	1	5½			
Total Amount of Expense of New Farm buildings - -							2,120	13	4½
Total Expenditure on Pobble O'Keefe, up to 31 March 1836 - - £.							5,256	3	8½

EXPENDITURE on the *King William's Town Farm* and the *Model-Farm*, from the commencement up to 31 March 1836.

	£.	s.	d.	£.	s.	d.
Town-Farm:						
Fenciog fields in the Town-farm - - - - - -	69	15	4			
Cost of draining, reclaiming, claying and liming - - - -	361	9	7			
Cultivating:						
Cost of ploughing, digging, sowing and saving crops, including the value of stable-manure - - - - - - - -	300	6	8½			
Total Cost of Village or Town-Farm - -				731	11	7½
Model-Farm:						
Fencing - - - - - - - - - - - -	78	–	7			
Reclaiming, cost of draining, claying and liming - - - -	191	9	9½			
Cultivation:						
Cost of ploughing, digging, sowing and saving crops, including seed, &c. - - - - - - - - - - - -	121	1	4½			
Total Cost of Model-Farm - -				390	11	9
Total - - - £.				*1,122	3	4½

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* In the statement of the general expenditure the expense incurred on the farm-account is given as 1,155 *l.* 14 *s.* 4½ *d.*, but this includes a sum of 33 *l.* 11 *s.*, under the head of lime, which lime has been used in reclaiming another portion of the estate.

RETURN from the *King William's Town Farm* and *Model-Farm*, from the commencement up to 31 March 1836.

		£.	s.	d.	£.	s.	d.
	RETURN FROM TOWN-FARM.						
1833:	Value of potatoe-crop on Four-acre Farm - - - -	16	13	1			
1834:	Value of ditto on Four-acre Farm - - - - -	9	16	8			
	Value of ditto in fields north and south of road in village -	10	8	2			
	Value of hay in Four acre Farm - - - - - -	1	10	–			
	Value of turnip-crop in ditto - - - - - -	12	9	5½			
1835:	Two hundred and thirty stone of oats, at 9 *d.* per, on Four-acre Farm - - - - - - - - - -	8	12	6			
	Forty-three hundred cwt. of straw, at 1 *s.* 2 *d.* per, on ditto -	2	10	2			
	Value of mangel-wurzel on ditto - - - - - -	4	4	–			
	Value of 20 cwt. of hay, at 1 *s.* 3 *d.*, on ditto - - - -	1	5	–			
	Value of 14¾ tons of turnips, at 15 *s.* 3 *d.* per, on ditto - -	11	4	11			
	Value of rape in field south of road in village - - -	–	10	–			
	Value of potatoe-crop in fields north and south of road in village, and also in the new field north of Four-acres - - -	43	3	1½			
	Produce of turnip-crop on ditto - - - - - -	55	16	8½			
	TOTAL Value of Produce on Town-Farm - -				178	3	9½
	RETURN OF MODEL-FARM.						
	1,230 stone of oats, at 9 *d.* per - - - - - - -	45	15	–			
	227 cwt. of straw, at 1 *s.* 2 *d.* per - - - - - - -	13	4	10			
	Value of potato-crop - - - - - - - - -	4	13	4			
	TOTAL Value of Produce on Model-Farm - -				63	13	2
	TOTAL Value of the whole Crops - - -				241	16	11½
	Portion of Outlay not Returned - - -				880	6	5
	£.				1,122	3	4½

CROWN LAND IMPROVEMENTS, &c.

PAPERS relative to CROWN LAND EXPERIMENTAL IMPROVEMENTS at *King William's Town, Cork*; and *Cork and Kerry New Roads.*

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